

8. The suspension of the power to grant medical degrees until such time as the Senate of the new University shall have satisfied the Lord President of the Council that an agreement has been reached with the Royal Colleges and the chief London Medical Schools as to the terms on which medical degrees shall be granted.

9. Providing, on the repeal of the Acts of Incorporation of University and King's Colleges which would accompany the granting of the new Charter, special regulations for the control of certain portions of the endowments or of certain branches of the College teaching, which it may not seem possible or advisable at present to hand over without special conditions to the management of the new Senate. For example, the Department of Divinity at King's College.

10. Paying due regard to the pecuniary interests of existing teachers (many of whom depend entirely upon students' fees) in the appointment of future University professors or readers.

11. Offering those professors of the existing Colleges, who might be willing to surrender the title of College professor, that of University reader, but not creating the occupants of chairs in any of the existing Colleges *ipso facto* professors in the new University.

In this mere sketch I have said nothing as to how faculties and boards of study might be constituted or as to how the University should grant degrees, for these seem to me "academical" problems, *i.e.* problems to be thrashed out by the University itself when it is once incorporated. Objection will be taken to much of the above by many individuals, but I believe it foreshadows the direction in which the *only scheme at present under discussion* must be modified if it is to lead to the ultimate establishment of a great teaching University in London, and not to a mere organization of teachers for examination purposes.

KARL PEARSON.

It seems to me that the force of the arguments of Profs. Lankester and Ramsay in last week's NATURE (May 28, pp. 76, 78), so far as they harmonize with each other, would have to be admitted, if the main object of a University were to foster that premature specialism, which, under the scholarship system, has already wrought great mischief to real education in this country, or to increase as far as possible the number of clever but half-educated specialists, with which a close acquaintance with any of the great scientific societies makes one only too familiar. The example of this has been well set by at least one of the great metropolitan day-schools. The fatal weakness of the arguments referred to is that they ignore, as no University ought to do, the claims of general education. If the advancement of scientific research is really desired by University and King's Colleges, all they have to do is to institute on their own account a diploma of the nature of the Associateship of the Royal School of Mines or College of Science, and make the training for it so good and thorough that the possessors of such a diploma shall be such a *desideratum* in those "commercial" quarters to which Prof. Ramsay appeals as a sort of final authority, that they shall drive such creatures as B.Sc.'s out of the field. Special brain-power, highly developed, is no doubt a splendid thing in its way, and recognition of it in the field of science is fully provided for in the B.Sc. honours, and in the ultimate D.Sc. degree; but, in considering the terms on which a degree should be given, general education and culture cannot be left out of account. In Germany something of the sort is guaranteed by the examinations which have to be passed on leaving the gymnasium (or high school) before students proceed to the University to specialize; in England it has been found necessary to institute the matriculation examination. That need, however, is no longer so imperative as it was; and for my own part I see no real objection to the "leaving certificate" of the Oxford and Cambridge Examining Board being accepted in lieu thereof; for I speak of what I know, when I say that this carries with it a guarantee of as much education and culture as the Matriculation Examination does, and often a great deal more. I would only stipulate that it should include one modern language and one branch of science.

Prof. Ramsay has over-ridden his horse, by the emphatic preference he gives to a German degree. He is a comparatively young man; but some of us (who are not yet quite senile) can remember the time when the facilities for obtaining the German Ph.D. degree were such (they are such to this day in America) that the degree became a by-word and a reproach, and still

carries with it suspicions altogether disadvantageous to those who have taken the genuine degree in Germany. This is surely a warning against the multiplication of small Universities in this country. Again, if the time-honoured Universities of Oxford and Cambridge are not proof against the temptation to swell the contents of the University chest by accepting fees for the silken degree of M.A., which in the eyes of the *vulgus* is supposed to represent higher intellectual attainments than the B.A., can we expect greater virtue in a small and brand-new University struggling to "make both ends meet"? Were any further illustration required of the way things would be likely to drift with small and independent degree-granting corporations, we might find it in the readiness with which the authorities of King's College threw over Latin two years ago in the mercantile department of their school (then in a state of depression), at the mere bidding of the Chambers of Commerce, although its retention had been advocated by two leading scientific men. The really inspiring motive of this agitation is, I think, astutely kept in the background.

A. IRVING.

Wellington College, Berks, June 1.

ONE of the taunts most frequently levelled at the London University—or "Burlington Gardens," to use Prof. Lankester's favourite expression—by certain professors of University College and other advocates of a "teaching University in and for London" is, that the present University is a "mere examining board." The University has, it is true, a Brown Professor of Physiology and Pathology, who delivers annually a course of lectures relating to the studies and researches carried on at the Brown Institution. But this professorship is an exception, though the University, by accepting the Brown Trust, showed clearly enough that it did not recognize any obligation to abstain from appointing University Professors and Lecturers. We have been previously told that there was a "tacit understanding" at the foundation of the University that this should not be done. But Prof. Ray Lankester goes far beyond the assertion of a "tacit understanding." He talks of "pledges" given by the founders of the University being "falsified," and "most solemn obligations" violated—terrible crimes, which, however, have been committed already by the appointment of the Brown Professor. But how such "obligations" and "pledges," or even a "tacit understanding," could ever have existed, I fail altogether to see, for it was the expressed intention of the founders of the University that its powers and privileges should be the same as those of the Universities of Oxford and Cambridge. Testimony as to this pledge may be found in the evidence given before the recent Commission. The late Dr. Carpenter's view of this matter was stated by Mr. Dickens in his communication to NATURE. Convocation has, years ago, voted in favour of the establishment of University Professorships and Lectureships, though I do not in the least believe that the graduates would sanction any proposal involving that the University should prepare candidates for its examinations, or compete with the ordinary work of the Professors in University College and other similar institutions. Whether research is or is not carried on successfully at University College is a matter on which I express no opinion. But, however this may be, it should be remembered that the students of this College have become only a small fraction of the candidates for London degrees. It would be, it seems to me, in the public interest that the University should make provision for the encouragement and reward of those among the great majority of its members who show a capacity for research and a power to extend the boundaries of knowledge. That the University has only one solitary Professor is due, I believe, in great measure to the narrowminded and unwise jealousy of University College, and to the fear lest some endowments should chance to be diverted to the University.

Prof. Lankester abandons altogether the scheme set forth in the Draft Charter of the "Albert University of London." This Charter proposed the establishment of a University whose range of activity should extend over colleges or other institutions in an area with a diameter of thirty miles. Prof. Lankester's ideal University, which would still be federal, is to consist only of University and King's Colleges. These institutions have not as yet shown any disposition to amalgamate the one with the other, and such a disposition is not likely to arise. They are, in fact, founded on distinct principles. The motto of the one, if I recollect rightly, is *Cuncti adsint* and of the other *Sancte et sapienter*. Some time ago I heard of a Society of University

College students being compelled to meet elsewhere instead of in the College on account of there being something of a religious character connected with their meetings, while there are facts of a different character in the history of King's College which may be easily remembered. That a federal University consisting of institutions so dissimilar would work harmoniously I very much doubt. Probably the graduates of the existing University would care but little, except on general public grounds, about University and King's Colleges having power to grant degrees, if as a University they would assume a name not likely to be mistaken for that of the University of London. As yet the Victoria University is not a conspicuous success, and the London University examinations are still held at Owens College.

With the views set forth by Mr. Thiselton Dyer I should be disposed in great measure to agree, though there are some points on which I should have liked to make some remarks; but I fear, if I did so, I should trespass too far on your space.

London, May 29.

THOMAS TYLER.

THOSE who have taken part in the interesting discussion on the University of London, in your columns, have all viewed the subject from the academic standpoint. Would it not be well to consider it also from another point of view, viz. that of the educational needs of London? Prof. Ramsay contends "that a University is primarily a place for the extension of the bounds of knowledge." It is surely more accurate to say that a University, under the conditions that now exist, has two main functions—the one the extension of the bounds of knowledge by research, and the other the wide diffusion of that knowledge. The purpose of such diffusion should be to afford, as far as possible, to every individual the opportunity of obtaining such a training as would qualify him or her to take part in the development of some branch of knowledge, or at any rate to follow with appreciation and interest the advance made by others.

It needs no argument to show that it would be for the advantage of research, and for the well-being of the community, that real University training should be as widespread as possible. Ability and bent for some special study may frequently not be developed until somewhat late in life, after a business career has been begun. There is scarcely a branch of science that does not owe much to investigators whose researches were carried on during hours spared from some bread-winning occupation. The late Prof. John Morris was in early life a chemist in the Borough; Dr. James Croll was for years the janitor of the Andersonian University, Glasgow; even in the very number of NATURE containing Mr. Dyer's letter, the case of M. Rouault, one of the pioneers in the geology of Brittany, is mentioned, who did his early work while carrying on the business of hairdresser. A University training would have been of inestimable value to such students as these (and there are hundreds of such, with capacity for good work, scattered over London and the country), but no provision is made for them in our existing system.

Surely the important question therefore is, What kind of University would discharge most effectively for London the duty of providing for the needs of every class of students? The University should clearly recognize all organized teaching of University rank, whether given within the walls of a specified College or not. One of the most urgent needs of London is a co-ordinating head for all its multifarious higher educational agencies. The only University that will really adequately meet the needs and stir the enthusiasm of Londoners will be a University in vital relation with and directing and controlling all the higher teaching of the metropolis. This would, no doubt, be a new type of University, but the changed conditions of these times necessitate large modifications in the constitution of our institutions. This is sufficiently illustrated by the fact that the University of London itself was a new type of University, as also was the more recent Victoria University.

The new teaching University for London should have as its accredited professors and lecturers the staffs of University and King's Colleges, the Royal College of Science, the various medical schools, and any other institutions of equal rank, and in addition a large staff of lecturers at work in different parts of the metropolis at convenient centres. It would be possible, by an extension of the principle admitted into the draft scheme for the re-constitution of the University of London, viz. that of requiring from every University teacher a syllabus of his course of teaching, and further, by making such syllabus the basis of the examination, to incorporate all the work done by the accredited

teachers of the University into its curriculum for degrees. This would make it possible to open up a University career to evening students. While day students would complete their course of study in three or four years, evening students would take nine or ten, and the curriculum could without serious difficulty be modified to meet the conditions.

May 30.

R. D. ROBERTS.

I WOULD ask whether it is quite fair to assume that, because Convocation has rejected the Charter proposed for the University of London, it therefore follows that that body is out of sympathy with the attempts that are being made to establish a "real University," whatever that may mean. Is it not possible that a large proportion of those adverse votes were recorded because there were elements in the scheme which were felt to be impracticable or open to serious objection? At all events, I feel sure that there are many who would refrain from regarding the vote as being an expression on the main issue.

The views so well put forward by Prof. Ray Lankester as to the undesirability of establishing what he terms federal Universities fully enlist our sympathies; but are we not sailing very near the wind in the suggestion that University and King's Colleges and "other institutions" should be incorporated on University lines?

I say, by all means avoid centralization and beware of the "never-ending Committees and schedules of such clumsily-organized Universities." But what of value is then left that University College does not already possess? Would the appropriate definition and allotment of degrees of all shades and grades have contributed one iota to the work and influence of Graham, Sanderson, Sharpey, Foster, Williamson, and Prof. Lankester himself, or have added to the benefit they have conferred upon University College? One does not surely regard the granting of degrees as an important element in the German University: its distinguished professors are not Berlin men or Strassburg men—they are pupils of Liebig, of Wöhler, of Bunsen, and the like; and its students are not regarded as graduates of Heidelberg or Giessen, but in like manner as pupils of so-and-so. And University College is, I take it, much more nearly in function a German University now than ever it is likely to be as a federal University. I verily believe that such is the taste of the so-called properly ordered English mind for schemes, plans, and organizations, that a governing body, even though largely composed of the most uncrystallizable elements, would shortly be found carefully hedging itself round (and the students) with that beautiful machinery which Prof. Lankester so heartily detests. Prof. Ramsay's association of "examination on the brain" with the London University undergraduate I fear does the said undergraduate an injustice, if it is meant to differentiate him from his fellows of the "real Universities."

The men who regard the College Calendar with its traditional questions as their *vade mecum*, and whose only other study is the idiosyncrasies of the examiner, are ubiquitous, and their name is legion. If I could think they were confined to the "Burlington Gardens University," I, for one, would vote against the alteration of one jot or tittle of the present organization, if only lest they might be disturbed from their resting-place there.

G. H. BAILEY.

May 30.

Quaternions and the Ausdehnungslehre.

PROF. GIBBS' second long letter was evidently written before he could have read my reply to the first. This is unfortunate, as it tends to confuse those third parties who may be interested in the question now raised. Of course that question is naturally confined to the invention of methods, for it would be preposterous to compare Grassmann with Hamilton as an analyst.

I have again read my article "Quaternions" in the *Encyc. Brit.*, and have consulted once more the authorities there referred to. I have not found anything which I should wish to alter. There is much, of course, which I should have liked to extend, had the Editor permitted. An article on Quaternions, rigorously limited to four pages, could obviously be no place for a discussion of Grassmann's scientific work, except in its bearings upon Hamilton's calculus. Moreover, had a similar article on the *Ausdehnungslehre* been asked of me, I should certainly have declined to undertake it. Since 1860, when I ceased to be a Professor of Mathematics, I have paid no special attention to